REMARKS/ARGUMENTS

Withdrawal of the Final Rejection and favorable reconsideration and allowance of the present application based on the following remarks are respectfully requested.

Upon entry of the above amendments, new claims 50-57 will be pending. Claims 50 is independent and substantially corresponds to previous generic claims 1 and 30, with further clarity added. New claim 51 substantially corresponds to prior claim 31 (one-pot reaction) while new claim 53 substantially corresponds to prior claim 32 (two-step reaction). Claim 52 corresponds to previous claim 33. Claim 54 substantially correspond to prior claims 35. Claim 55 is directed to the embodiment of the invention wherein the amount of the hydrolyzed silane coupling agent is selected to achieve the high ligand loading level of about 7.5 mmole per gram of silica gel. Claim 56 is directed to the embodiment wherein the hydrolyzed silane coupling agent is selected from one of the coupling agents as exemplified on page 32, lines 7-16. Claim 57 is directed to the embodiment of the invention disclosed on page 31, lines 7-31; see, also, original claim 14.

New claim 50 differs from previous claim 30 to clarify that the high ligand loading level of up to about 7.5 mmole per gram of silica gel is not random but is selectable by control of reaction stoichiometry and kinetics, for example, degree of reaction (reaction yield) and/or amount of the hydrolyzed silane coupling agent used to introduce the surface modifying ligands. See, *e.g.*, page 19, lines 1-9.

Claim 50 also provides a clarifying recital of the nature of a one-pot reaction from a two-step reaction, namely, in the former, surface modification takes place in the same reactor as wet gel-formation, whereas in the latter, surface modification takes place separately following wet gel-formation while the gel is still in the wet state.

Claim 50 is also directed to a more preferred embodiment wherein the mixed aqueous solvent is a mixed aqueous-alcohol solvent (see, *e.g.*, previous claim 34).

Accordingly, no new matter is added by the newly presented claims.

In view of the presentation of the new independent claim 50, which encompasses the one-pot reaction and the two-step reaction of previous claims 1-3, and 30-32, it is respectfully requested that the restriction requirement be reconsidered and withdrawn.

Claim 50 is generic to the embodiments of the one-pot and two-step reactions. Both embodiments result in an open channel nanoporous silica gel which permits reaction with the ligand introducing hydrolyzed silane coupling agent under favorable conditions for high ligand loading. Both embodiments are characterized by wet gel formation and by surface modification of the wet gel, *i.e.,* before cross-linking condensation. Both embodiments can achieve high ligand loading up to a theoretical maximum, not achieved, or achievable, by the prior art, of up to about 7.5 mmole per gram of silica gel.

Thus, claims 51 and 52 (one-pot) and claim 53 (two-step) embodiments are properly dependent from claim 50.

The cancellation of the withdrawn claims is to facilitate prosecution is not an indication of any intention of abandonment of the withdrawn subject matter. Applicants request that the restriction requirement, in its entirety, be withdrawn and the corresponding claims be rejoined into this application. Nevertheless, Applicants reserve the right, under 35 U.S.C. 121, to file one or more divisional applications to any subject matter which was subject to restriction as well as to any other subject matter disclosed herein but not otherwise explicitly encompassed within the scope of the pending claims, whether or not otherwise protected by doctrine of equivalents or other means.

Claims 14, 30 and 32 were rejected under 35 U.S.C. 102(a) as anticipated by, or under 35 U.S.C. 103(a), as unpatentably obvious over, Burns et al, U.S. 5,708,069.

This rejection is respectfully traversed for at least the following reasons.

Of course, at this time, the subject matter of claim 14 is no longer pending and this ground for rejection is moot. To the extent, however, that subject matter from claim 14 is incorporated into new claim 57, it is respectfully submitted that in the absence of a disclosure in Burns of any ligand introducing compound wherein the functional groups at the first and second ends are designed and selected based on at least one of bond energy between the second functional group and the target specie (whatever the target species may be) or solubility product

constant, Ksp, the subject matter of claim 57 is neither anticipated by nor obvious over Burns. Therefore, Burns does not anticipate any species because Burns does not select the functional groups on the basis as set forth in claim 57.

In fact, Burns et al does not at all address preparing a chemically surface modified silica gel effective for adsorbing a target specie but, rather, is concerned with silica gels as filler materials.

As for new claims 50 and 53, verbiage aside, Burns does not disclose a process which maintains an open channel pore structure connecting at least nanopores. In any case, at least to the extent that claim 50 recites an aqueous-alcoholic solvent, the rejection of claims 14, 30 and 32, as anticipated by, or as unpatentably obvious in view of, Burns, is moot.

Accordingly, reconsideration and withdrawal of the rejection based on Burns et al is respectfully requested.

Claims, 14, 30, 32, 34 and 35 are rejected under 35 U.S.C. 102(b), as anticipated by, or under 35 U.S.C. 103(a), as unpatentably obvious, over Lentz, U.S. 3,122,520.

This rejection is respectfully traversed for at least the following reasons.

The process disclosed by Lentz does not include a step of creating and preserving a plurality of open channels within a gel structure and a plurality of surface silanol groups by preventing crosslinking condensation from occurring, either generally or specifically, prior to reaction with a ligand-carrying silane coupling reaction. In fact, the process of Lentz does not employ a hydrolyzed silane coupling agent but instead uses an organosilicon compound of the group of silanes and siloxanes, having the formula shown in column 1 and claim 1. This may be cross-referenced, for example, to the hydrolyzed ligand coupling reagents as set forth in new claim 56.

In particular, Lentz discloses a method for forming silicone rubber fillers by heating a silica hydrosol under strong acid conditions and subsequently forming an organosol by solvent exchange, using, *e.g.*, hexamethyldisiloxane, often as both reactant and solvent, simultaneously or with solvent exchange with, *e.g.*, hexane or toluene. As noted from the Examples, the quantity of the organic solvent is several times higher than the amount of water being exchanged. This process, therefore, necessarily results in phase separation.

Nothing in the disclosure by Lentz teaches the practitioner to create and preserve a plurality of open channels within the gel structure by preventing crosslinking condensation from occurring. In the Examples 7 and 9 specifically identified in the Action, the formation of the hydrogel does not take place in a aqueous-alcoholic medium. Rather, it was only after refluxing for 3 hours and cooling to 70 °C that isopropyl alcohol was added. These are not conditions designed to create and preserve open channels. Open channels are of apparently no particular benefit to the use of the resulting end product organogels as fillers for rubbers. Therefore, while the end use may not be of relevance, *per se*, it is of relevance in appreciating the differences between the methods (and objectives thereof) of the reference and the rejected claims.

Moreover, the process of Lentz does not maintain a freshly prepared silica gel at a temperature in the range of from 40 to 80°C. for from 30 to 60 minutes. In Example 7 of Lentz, the hydrogel was refluxed for 3 hours and in Example 9, the hydrosol is heated for 24 hours. Therefore, for this reason alone, the subject matter of claim 53 is neither anticipated by nor obvious in view of Lentz.

With regard to claim 14 (and new claim 57), the disclosure of Lentz et al does not teach this subject matter for at least the same reasons as set forth above with respect to Burn.

Accordingly, it is respectfully submitted that the process disclosed by Lentz does not anticipate or render obvious the subject matter as set forth in the pending claims.

Therefore, reconsideration and withdrawal of the rejection based on Lentz is respectfully requested.

Therefore, all objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and a Notice to that effect is earnestly solicited.

Should any issues remain unresolved, the Examiner is encouraged to contact the undersigned attorney for Applicants at the telephone number indicated below in order to expeditiously resolve any remaining issues.

Respectfully submitted,

MAYER BROWN ROWE & MAW LLP

By: Richard A. Steinberg

Richard A. Steinberg
Registration No. 26,588
Direct No. (202) 263-3325

Paul L. Sharer
Registration No. 36,004
Direct No. (202) 263-3340

Intellectual Property Group
1909 K Street, N.W.
Washington, D.C. 20006-1101
(202) 263-3000 Telephone
(202) 263-3300 Facsimile

Date: October 3, 2005